

CASE REPORT

Acute pancreatitis in a child with SARS-CoV-2 infection

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Case Report

A 9-year-old girl awoke with sudden onset severe epigastric pain, profuse vomiting, and was unable to tolerate any oral intake. She had no other gastrointestinal symptoms, diarrhoea or constipation. The patient was subsequently brought into a West Australian regional hospital by her father.

At the time of presentation, the patient was at day 6 of COVID disease (tested positive on polymerase chain reaction (PCR)). She had mild upper respiratory tract symptoms, which had resolved by the time of this presentation. She was an otherwise well child, with no significant medical history, no regular medications and no known allergies. Of note, the patient had not received any COVID-19 vaccinations, though was up to date with all other routine vaccinations.

On examination in the emergency department, the patient had normal vital signs (pulse rate 78, respiratory rate 22, afebrile) with mild dehydration and epigastric tenderness. Blood tests revealed a lipase of 13 500 U/L, while other laboratory test results were unremarkable (full blood count, liver function tests, urea, electrolytes, creatinine, C-reactive protein and glucose). Given her clinical symptoms and elevated lipase level, a clinical diagnosis of acute pancreatitis was made. Surgical review recommended an abdominal computed tomography (CT) scan which demonstrated a moderate amount of ascites diffusely distributed in the abdomen, and a slightly bulky and heterogenous pancreas consistent with pancreatitis.

Key points

- 1 Acute pancreatitis may be one of the manifestations of COVID-19 and may manifest after initial 'typical' respiratory symptoms have resolved.
- 2 Acute pancreatitis should be considered as a differential diagnosis in children with COVID-19 who present with severe abdominal pain and/or vomiting.
- 3 More research is required to identify the prevalence of acute pancreatitis in paediatric patients with COVID-19 and outcomes.

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Targeted assessment and investigations sought the cause of her pancreatitis. There was no history of alcohol or drug intake, medication usage, trauma, or previous personal or familial history of pancreatitis. Ultrasound of the abdomen did not reveal gallstones, and blood tests for calcium and triglyceride levels were normal. Viral serologies did not suggest acute infection with mumps (IgG positive and IgM negative), varicella zoster virus (IgG positive), cytomegalovirus (IgG and IgM negative), Epstein-Barr virus (IgG positive, IgM and EBNA antibody negative) and herpes simplex -1 and -2 viruses (IgG negative) – though we are cognisant of the limitations of acute serology without subsequent testing for seroconversion.

The patient was managed conservatively with simple analgesia, antiemetics and intravenous hydration. She had symptomatic improvement and was discharged after a 3-day admission. Telephone follow-up was undertaken at 6 weeks and her mother advised the patient had made a full recovery within a week of discharge and had not developed any complications.

Discussion

Since late 2019, the emergence of the novel coronavirus (SARS-CoV-2) has been a prevailing focus in medical practice and publishing. COVID-19 can affect all age groups, although the disease is generally milder in children.¹ The most common clinical manifestations of SARS-CoV-2 in children include fever (51%) and cough (41%),¹ with gastrointestinal signs and symptoms (8–10%) being the most common extrapulmonary manifestations including diarrhoea, abdominal pain and vomiting.²

Acute pancreatitis can be diagnosed by fulfilling at least two of the following three criteria: (i) abdominal pain consistent with acute pancreatitis; (ii) serum lipase at least three times the upper limit of normal; and (iii) characteristic findings on radiological imaging.³ Our patient fulfilled all three criteria. The incidence of acute pancreatitis in paediatric populations has been reported at 3–13 cases per 100 000 persons per year.³ Established causes of acute pancreatitis in children include trauma (7.6–36.3%), idiopathic (8–34%), biliary pathology (5.4–30.4%), anatomical abnormalities (1.5–25.9%), drugs (3.2–19.9%), metabolic conditions (0.7–6.2%) and familial factors (0.9–5.5%).⁴

The proposed pathophysiology of SARS-CoV-2 in acute pancreatitis involves the binding of SARS-CoV-2 to angiotensin-converting enzyme 2 (ACE2), which is expressed in both exocrine glands and islet cells of the pancreas, leading to pancreatic injury.⁵

A systematic review found 256 cases reported world-wide of patients with concomitant SARS-CoV-2 infection (diagnosed with PCR) and acute pancreatitis (diagnosed with Atlanta Criteria).⁶ Patients were more likely to be male (44%) than female (25.3%). Ages ranged from 5 to 97 years, with a median age of 50 years.⁶

Specific ages of all patients were not included, and it is unknown how many children were included in the study. The most common clinical presentations included generalised symptoms (malaise, fever, shortness of breath and cough) and/or symptoms of acute pancreatitis (abdominal pain and vomiting).⁶

A retrospective cohort study demonstrated that in 189 patients with acute pancreatitis, idiopathic pancreatitis was the most common aetiology in patients with concomitant COVID-19 (69%) compared to those who were COVID-19 negative (21%) ($P < 0.0001$), implicating SARS-CoV-2 in a causative role.⁷ In a paediatric population of over 8000 patients, a retrospective study identified that of 13 patients diagnosed with acute pancreatitis, the point prevalence in patients with COVID-19 was 1.8% compared to 0.14% in non-COVID patients.⁸

To our knowledge, this is the first case described in Australia of a paediatric patient with SARS-CoV-2 infection presenting with acute pancreatitis without any other discernible cause. This case report aims to add to the growing number of cases identifying SARS-CoV-2 as a potential cause of acute pancreatitis in children. It is important for clinicians to consider acute pancreatitis as a differential diagnosis in children presenting with abdominal pain and/or vomiting with COVID-19. Patients who are suspected of having SARS-CoV-2 induced acute pancreatitis should have timely follow-up to assess recovery and identify any complications.

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